

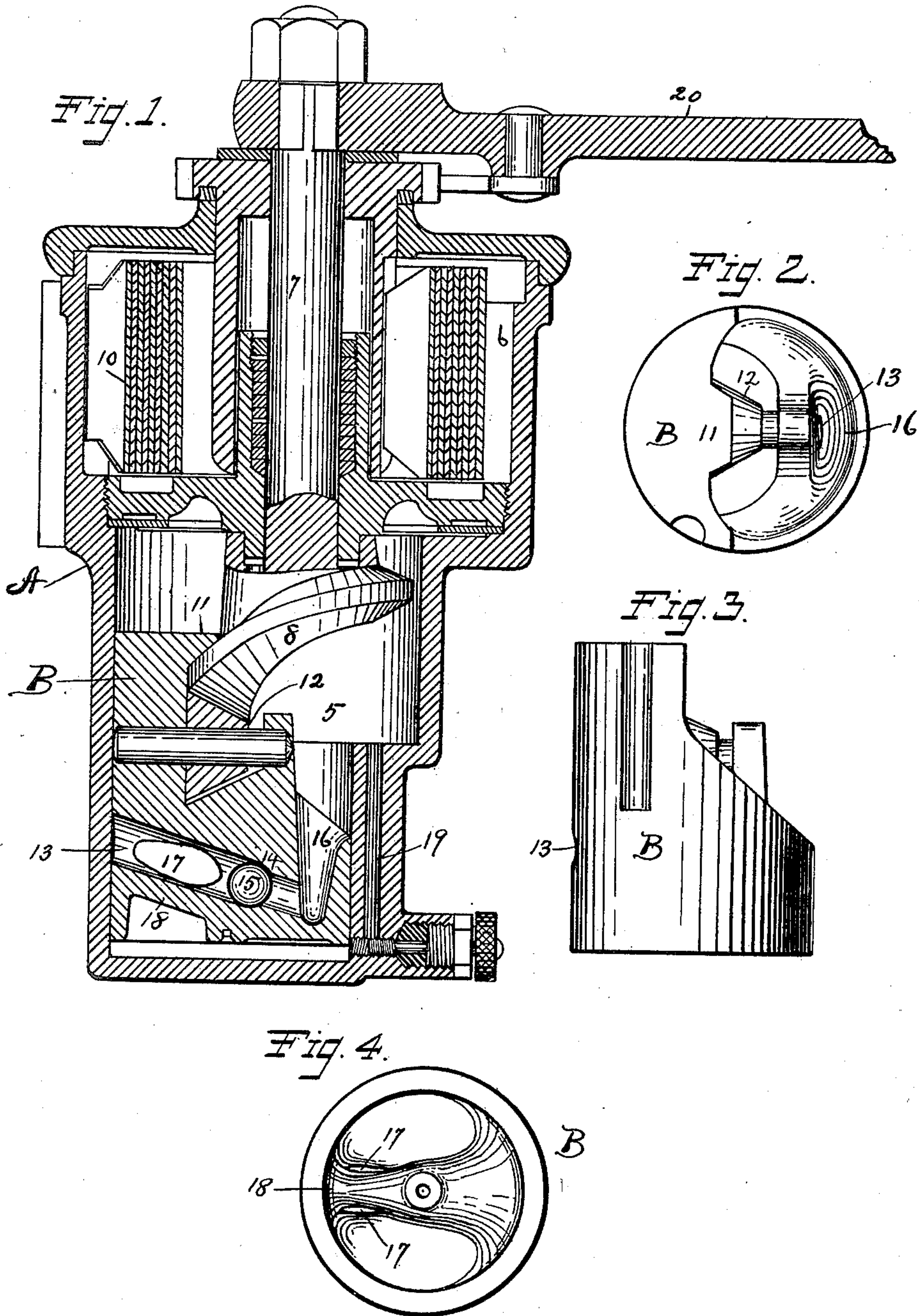
No. 706,240.

Patented Aug. 5, 1902.

H. K. JONES.
LIQUID DOOR CHECK.

(Application filed Feb. 28, 1902.)

(No Model.)



Witnesses.
S. H. Clarke
P. J. Egan

Inventor.
Horace H. Jones.
By James Shepard.
Atty.

UNITED STATES PATENT OFFICE.

HORACE K. JONES, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE
RUSSELL AND ERWIN MANUFACTURING COMPANY, OF NEW BRIT-
AIN, CONNECTICUT.

LIQUID DOOR-CHECK.

SPECIFICATION forming part of Letters Patent No. 706,240, dated August 5, 1902.

Application filed February 28, 1902. Serial No. 96,071. (No model.)

To all whom it may concern:

Be it known that I, HORACE K. JONES, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Liquid Door-Checks, of which the following is a specification.

My invention relates to improvements in liquid door-checks; and the object of my improvement is to provide a cheap and simple construction of a piston and valve that will firmly close at the beginning of the forward stroke of the piston and without any shock.

In the accompanying drawings, Figure 1 is a central vertical section, partly in elevation, of a liquid door-check constructed in accordance with my invention. Fig. 2 is a detached plan view of the piston. Fig. 3 is a side elevation of the same, and Fig. 4 is a reverse plan view of the said piston.

A designates the case, having a combined cam chamber and cylinder 5 at its lower end and a spring-chamber 6 at its upper end. The cam-shaft 7 extends down through the spring-chamber and is provided at its lower end with the cam 8 within the combined cam chamber and cylinder, the said cam acting, by means of the spring 10, crank-arm 20, and ordinary connections with a door, to raise and lower the piston B. I have shown the cam 8 as acting on a projection 11 to raise the piston and on the roller 12 to force it downwardly, but the parts thus far described may be of any ordinary or known construction. The piston is mainly in the form of a cylindrical block and is provided with a transverse bore or passage 13, leading from its periphery inwardly to a passage 16, leading from the upper end of the piston downwardly to near its lower end. The passage 13 is contracted just before reaching the passage 16 to form a shoulder or valve-seat 14 for the ball-valve 15. At the side of the ball-seat that is farthest from the downwardly-extended passage 16 there are two side openings 17 in the side walls of the bore or passage 13, that extend through to the outer sides of the rib 18 in the recessed lower end or under side of the piston. The check shown is

intended for use with the piston in the vertical position illustrated in the drawings, and in order to have the ball-valve always resting on its seat for closing the passage 13 except when forced back to open it I make the bore 13 on an incline, as shown, so that the ball-valve will roll by gravity into its position on the valve-seat for closing the valve. As shown in Fig. 1, the piston is at the lower end of its stroke. Upon opening the door the piston is raised and the spring wound up, the liquid during the upward stroke of the piston flowing down through the piston to the passage 13 against the ball and forcing it back away from the valve-seat, and then the liquid flows out through the side passages 17 to the lower end of the piston. As soon as the piston comes to a rest preparatory to its return movement the ball-valve rolls down to its seat and closes the passage 13, so that the valve is closed when the piston begins to return, thereby confining the liquid at the lower end of the piston, where it can escape to the upper end only through the vent-passage 19. By thus closing the valve by gravity the closing action of the door is smooth and even, without any shock or sudden jar, as there is in checks in which the movement of the liquid under the downward stroke of the piston is depended upon to close the valve.

The construction is simple and inexpensive and is particularly adapted for the block-like style of piston herein shown. The recessed under side or lower end of the piston with its transverse rib 18 and the upper side of the piston with its downwardly-extending passage 16 are formed by casting, and the rib 18 is made of a thickness a little less than the diameter of the bore or passage 13, so that merely boring and counterboring the piston transversely along the line of the said rib to the passage 16 will form the passage 13, valve-seat 14, and openings 17 by reason of the bore running out through the sides of the rib 18 when the passage 13 is being formed. The bore 13 must be large enough to allow the ball to work freely; but the main provision for the downward flow of the liquid through the piston is provided for by having

the ball-valve forced back sufficiently to let the liquid freely through the transverse openings 17.

I claim as my invention—

- 5 1. In a liquid door-check, the combination of the piston having the passage 16 leading downwardly from its upper end, a transverse passage 13 leading from the periphery inwardly to the said passage 16, said passage
10 13 having a valve-seat therein and transverse openings leading down to the lower end of the piston, with a ball-valve confined within the said passage 13, substantially as described.
- 15 2. In a liquid door-check, a piston provided with an opening extending therethrough, part

of said opening consisting of a transverse inclined passage having open communication with the lower end of said piston, said inclined passage being contracted in its lower portion 20 to form a valve-seat, said contracted portion having open communication with the upper end of said piston, a ball-valve in said inclined passage and normally held by gravity in such relation to its seat as to permit the 25 flow of liquid in one direction only, substantially as described.

HORACE K. JONES.

Witnesses:

M. S. WIARD,
M. E. WIGHTMAN.